Name: Date:

Polynomial Factoring solution (version 14)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 6x + 33 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(-6) \pm \sqrt{36 - 132}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-96}}{2}$$

$$x = \frac{6 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{6 \pm 4\sqrt{6}\, i}{2}$$

$$x = 3 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $4 - 7i$ and $-8 - 5i$ in standard form $(a + bi)$.**

Solution

$$(4 - 7i) \cdot (-8 - 5i)$$

$$-32 - 20i + 56i + 35i^2$$

$$-32 - 20i + 56i - 35$$

$$-32 - 35 - 20i + 56i$$

$$-67 + 36i$$

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3. **Write function $f(x) = x^3 + x^2 - 26x + 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	1	-26	24
-6		-6	30	-24
	1	-5	4	0

$$f(x) = (x + 6)(x^2 - 5x + 4)$$

$$f(x) = (x + 6)(x - 4)(x - 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 7)^2 \cdot (x + 2) \cdot (x - 2)^2$$

Sketch a graph of polynomial $y = p(x)$.